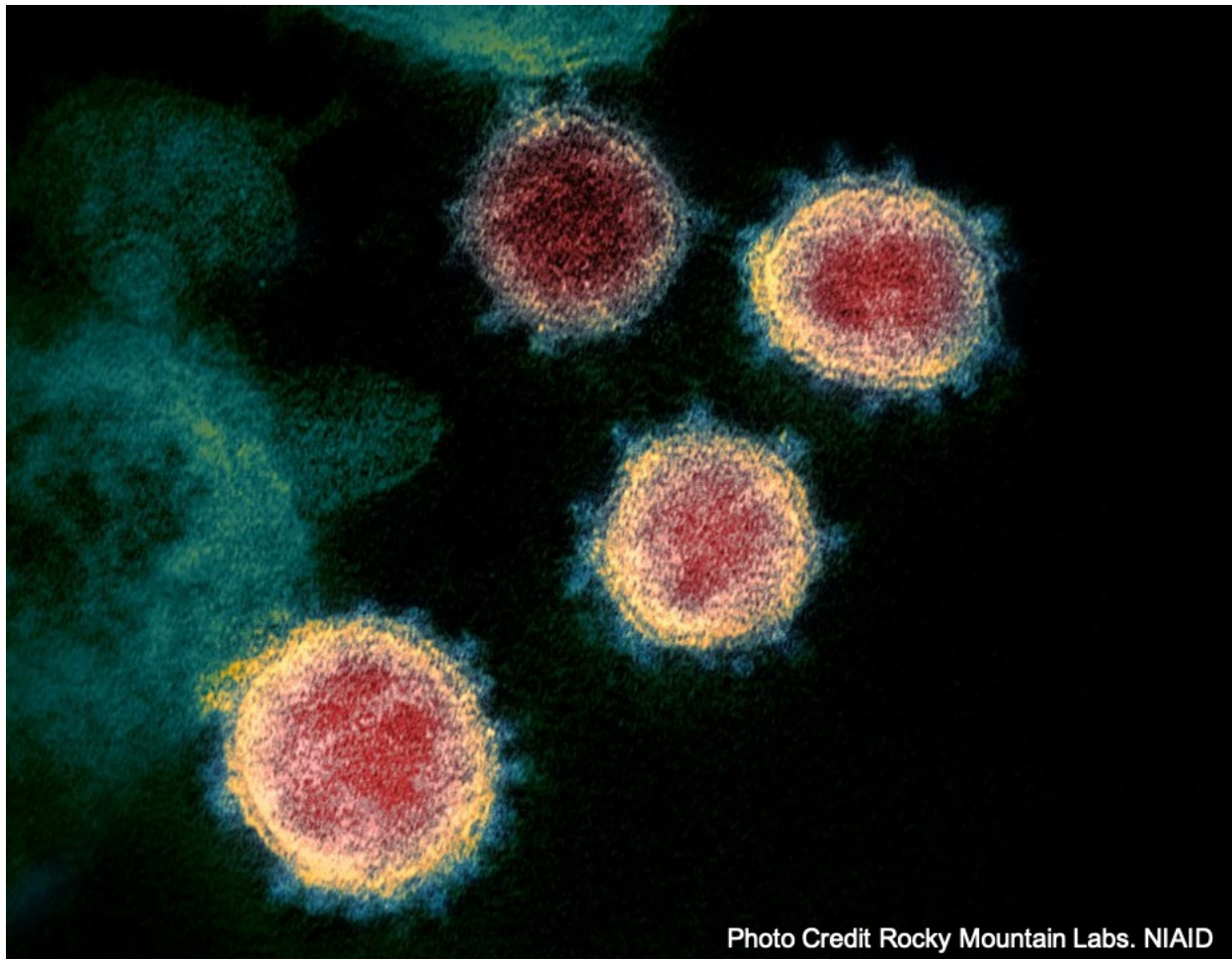


Program and Abstract Book

NIH/FDA COVID-19 Research Workshop December 15-16th, 2022



**Virtual Event Organized by:
The NIH/FDA COVID-19 SIG**

NIH/FDA COVID-19 Research Workshop

December 15-16, 2022
Virtual Event

PHOTO CREDIT: ROCKY MOUNTAIN LABS, NIAID

DAY ONE Thursday, December 15th, 2022

10:30 AM	KEYNOTE Janet Woodcock Introduction by Surender Khurana	Principal Deputy Commissioner of The Food and Drug Administration Response of Scientific, Medical, Product Development and Regulatory Communities to the Recent Pandemic
11:00 AM	SESSION I: Main Talks Chairs: Nihal Altan-Bonnet and Alex Compton	
11:00 AM	Kaiyuan Sun	Rapidly shifting immunologic landscape and severity of SARS-CoV-2 in the Omicron era in South Africa
11:13 AM	Camila Silva	Detection of SARS-CoV-2 Variants of Concern in Wastewater in two Metropolitan Areas of Arkansas
11:26 AM	Oscar Florez-Vargas	Genetic regulation of OAS1 nonsense-mediated decay underlies association with COVID-19 hospitalization in patients of European and African ancestries
11:39 AM	Sydney Stein	SARS-CoV-2 infection and persistence in the human body and brain at autopsy
11:52 AM	Elodie Ghedin	Altered glycomic and metabolic profiles observed in blood of patients who have recovered from COVID19
12:05 PM	Brittany Poelaert	Sharing SARS-CoV-2 Variants and Therapeutics Data on NCATS OpenData Portal
12:30PM-1:00PM	BREAK	
1:00 PM-2:30 PM	SESSION IIA: Virology Chairs: Eric Freed and Robin Stanley	
1:00 PM	Alex Compton	Omicron Spike endows SARS-CoV-2 with enhanced infectivity and resistance to the interferon-induced antiviral state in primary nasal epithelia
1:10 PM	Seungbum Park	Naturally Occurring Spike Protein Mutations Responsible for Attenuated Fusogenic Phenotype of SARS-CoV-2 Omicron Variants
1:17 PM	Robert Brosh	Biochemical Analysis of the SARS-CoV-2 Nsp13 Helicase Implicated in COVID-19 and Required for Coronavirus Replication

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1:27 PM	Meredith Frazier	Flipped over U: structural basis for dsRNA cleavage by the SARS-CoV-2 endoribonuclease
1:34 PM	Mamata Panigrahi*	More is Less, Negative regulation of innate immune response by Viral RNA quantity
1:39 PM	Dongya Jia*	A universal critical viral mass overrides the innate immune response
1:47 PM	Alberto Lopez-Munoz	Cell Surface Nucleocapsid Protein: An Evolutionary Conserved Immunomodulatory Strategy of Betacoronaviruses?
1:54 PM	Peer Karmaus	Meta-analysis of COVID-19 scRNA-Seq reveals alveolar epithelial transitions and unique alveolar epithelial cell fates
2:01 PM	Catherine Farrell	Curated regulatory elements for COVID-19-related human host genes in the RefSeq Functional Elements resource
2:08 PM	Benedict Anchang	Visualizing COVID-19 progression as forest mixtures

* = joint Q&A

1:00 PM-2:30 PM **SESSION IIB: Clinical**

Chairs: Veronique Nussenblatt and Irini Sereti

1:00 PM	Qin Xu	Robust, prolonged adaptive immune responses to SARS-CoV-2 in tonsils and adenoids of convalescent children
1:10 PM	Hyekyung Lee	Immune responses following COVID-19 infection and vaccination
1:20 PM	Paolo Lusso	High Prevalence of Anti-PF4 Antibodies in Hospitalized Patients with Covid-19
1:27 PM	Zhaohua Zhou	Early Antibody to SARS-Cov-2 is Associated with Survival in Hospitalized Patients
1:34 PM	Gina Montealegre	PECOS (Pediatric SARS-CoV-2 MIS-C Long-term Outcomes Study): Preliminary Results

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1:41 PM	Andrew Platt	Bacterial and Fungal Pulmonary Co-Infections in a COVID-19 Autopsy Case Series
1:48 PM	Shreya Kanth*	Evolution Of The Proteomic Landscape In The Lungs Of Patients With SARS-CoV-2 Infection
1:53 PM	Julio Huapaya*	Longitudinal Evaluation Of Blood Cellular Immune Markers and Lung Proteomics in Vaccinated Patients with SARS-CoV-2 Breakthrough Infections
2:01 PM	Joyce Chung	Comparative Rates of Lifetime and Current Mental Health Diagnoses among COVID-19 Patients with and without Post-Acute Sequelae of SARS-CoV-2
2:08 PM	Myonghwa Lee±	Neurovascular injury with complement activation and inflammation in COVID-19
2:13 PM	Yair Mina±	Deep Phenotyping of Neurological Post-Acute Sequelae of SARS-CoV2 Infection
	* Joint Q&A	
	± Joint Q&A	
2:30PM-2:45PM	BREAK	
2:45 PM-4:10 PM	Session IIIA: Therapeutics	
	Chairs: Matthew Hall and Tracey Rouault	
2:45 PM	John Misasi	A multispecific antibody prevents immune escape and confers pan-SARS-CoV-2 neutralization
2:58 PM	Forrest Jessop	Prolyl Hydroxylase Inhibition and HIF-dependent Metabolic Reprogramming Protects Against Lethal SARS-CoV-2 Infection
3:11 PM	Huixiao Hong	Identifying safety signature of drugs administered to COVID-19 patients through adverse events analysis
3:18 PM	Leonid Margolis	SARS-CoV-2 infection of human lung ex vivo: Benchmarking the system
3:25 PM	Meaghan Flagg	Donor-dependent responses to SARS-CoV-2 variants of concern in human lung organoids

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3:32 PM	Javier Revollo	Molnupiravir and its active metabolite N4-hydroxycytidine induce mutations in mammalian cell cultures
3:39 PM	Mohsin Khan	Lonafarnib is a potent inhibitor of SARS-CoV-2 infection in vitro and in vivo and can be repurposed for COVID-19 treatment
3:46 PM	Nunziata Maio	Virus-host interactions in COVID-19. Hijacking the iron-sulfur cluster assembly machinery for replication; advantages and targetable vulnerabilities
3:53 PM	Mitchell Ho	Camel and shark single-domain antibodies broadly neutralize SARS-CoV-2 variants
2:45 PM- 4:10 PM	Session IIIB: Immunology	
	Chairs: Daniella Verthelyi and Mark Connors	
2:45 PM	Sara Alehashemi	Antiviral innate immunity is diminished in the upper respiratory tract of severe COVID-19 patients
2:58 PM	Lau William	Influenza vaccination and single cell multiomics reveal sex dimorphic immune imprints of prior mild COVID-19
3:11 PM	Shamik Majumdar	Ackr1-deficient mice are protected from lethal SARS-CoV-2 challenge
3:21 PM	Christine Nelson	IL-10 Suppresses T Cell Expansion While Promoting Tissue-Resident Memory Cell Formation During SARS-CoV-2 Infection in Rhesus Macaques
3:31 PM	Paul Baker*	Immunological history of the lung governs innate resistance to SARS-CoV-2
3:38 PM	Kerry Hilligan*	Pre-existing interferon gamma responses condition the lung to mediate early control of SARS-CoV-2 infection
3:45 PM	Ainslee Zou	Characterization of SARS-CoV-2-specific CD8+ T cells in COVID-19 convalescent, vaccinated, and individuals
3:52 PM	Siddharth Krishnamurthy	Nutritional and Microbiota Synergy Control Enteric Coronavirus Infection

**Joint Q&A*

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4:15 PM- Session IV-A FLASHTALKS: Clinical, Data Science, & Pathology

5:30 PM

Chairs: Kanal Singh and Renee Ridzon

4:15 PM	Adriaan Bax	Could snoring be a major contributor to COVID-19 severity?
4:20 PM	Mary Richert	Cell-Free DNA to Identify Tissue Injury in COVID-19 Associated Complications
4:25 PM	Haley Chatelaine	Metabolomics for COVID-19 Insight: Metabolomic Profiling of Longitudinal EMR and Omics COVID-19 Cohort (LEOCC) Reveals Metabolites Prospectively Associated with COVID-19 Severity and Progression Time of Sampling
4:30 PM	Laura Swett	Long Covid-19 Clinical Trial Design and Endpoints: Decision Tree for Clinical Outcome Assessment Measurement Strategies
4:35 PM	Ashira Lubkin	SARS-CoV2 infection predisposes patients to superinfection with low-cytotoxicity Staphylococcus aureus strains
4:40 PM	Sarah Warner	Do Empiric Antibiotics Improve Outcomes in Clinically Stable Patients Admitted with COVID-19 Pneumonia? Retrospective Cohort Study of 221 U.S. Hospitals, March 1st, 2020 , December 31st, 2020
4:45 PM	Ainhua Perez-Diez	Prevalence and complement activation of anti-lymphocyte IgM antibodies in hospitalized COVID-19 patients
4:50 PM	Shiva Singh	Automated Segmentation of Human Lung Lesion using Non-human Primate Models: AI and Us
4:55 PM	Ellen Jones	Applying imaging mass spectrometry to define the N-glycan profiles of co-localized virus and immune cell infiltrates in COVID-19 infected tissues
5:00 PM	Samantha Cotsmire	Characterization of delta and omicron infection in primary lower respiratory tract transwell lung models
5:05 PM	Seongwon Nho	Ex vivo modelling of human coronavirus (HCoV) infection in primary human airway epithelial cells (pHAEC)

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4:15 PM- Session IV-B FLASHTALKS: Virology, Structure, and Genomics

5:30 PM

Chairs: Alex Compton and Peter Sun

4:15 PM	Weichun Tang	SARS-CoV-2 variants exhibit distinct replication kinetics in vitro and in vivo
4:20 PM	Jiansheng Jiang	Identification of Epitope Sites on the Receptor Binding Domain (RBD) of SARS-CoV-2: The Vital Role of the Complementarity Determining region (CDR) loops in Recognizing Epitopes
4:25 PM	Pablo Contreras	Beta-coronaviruses exploit cellular stress responses by modulating TFEB and TFE3 activity
4:30 PM	Martina Kosikova	Omicron subvariants exhibit increased immune evasion but reduced virulence than Delta and early SARS-CoV-2 strains
4:35 PM	Isha Wilson	Biochemical Characterization of Emerging SARS-CoV-2 Nsp15 Endoribonuclease Variants
4:40 PM	Hana Veler	Guanylate binding protein 5: Impairing virion infectivity by targeting viral envelope glycoproteins
4:45 PM	Ankit Gupta	TUT4/7-mediated uridylation of coronavirus' mRNA delays viral replication
4:50 PM	Jennifer Petersen	The Delta SARS-CoV-2 variant spike protein mediates unique aggregation of pseudotyped retroviral particles
4:55 PM	Allie Kreitman	Genomic analysis of the early COVID-19 pandemic in Haiti reveals Caribbean-specific SARS-CoV-2 lineage dynamics
5:00 PM	Nigam Padhiar	Analysis of 3.5 million SARS-CoV-2 sequences reveals unique mutational trends
5:05 PM	Kate Johnson	Optimized detection of deletions in virus genomes reveals unique within-host deletion dynamics in SARS-CoV-2 lineages

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4:15 PM- Session IV-C FLASHTALKS: Public Policy

5:30 PM

Chairs: Emily Ricotta and Hilary Marston

4:15 PM	Vijay Ramchandani	Multidimensional Impact of COVID-related Stressors on Alcohol and Related Outcomes: A Person-Centered Approach to Understanding Health Disparities
4:20 PM	Bethany Stangl	Examining changes in alcohol consumption by risk level during the covid-19 pandemic and associated measures through the addictions neuroclinical assessment framework
4:25 PM	Emma McCabe	Exercising healthy behaviors: A latent class analysis of positive coping during the COVID-19 pandemic and associations with alcohol-related and mental health outcomes
4:30 PM	Gabrielle Barr	Meeting the Moment: Documenting NIH's Response to COVID-19
4:35 PM	Kelvin Choi	Financial hardship during the COVID-19 pandemic and increased receipt of commercial tobacco discount coupon among U.S. adults who use commercial tobacco
4:40 PM	Kasra Zarei	Financial challenges and hardship during the COVID-19 pandemic and tobacco expenditure minimizing strategies among U.S. adult commercial tobacco users
4:45 PM	Phan Lilianna	Race, Concern about COVID-19 Discrimination, and Cigarette Smoking Behavior: Comparison between U.S. Asian and White Adults Who Use Commercial Tobacco
4:50 PM	Kristen Hamilton-Moseley	Associations of witnessing COVID-19-related discrimination with concern and vigilance
4:55 PM	Amanda Perfosky	The impact of COVID-19 restrictions and mobility behavior on respiratory pathogen transmission in Seattle, Washington
5:00 PM	Paula Strassle	Association between COVID-Related Discrimination, Vaccination Willingness, and Vaccination Uptake among a Nationally Representative, Diverse Sample of Adults in the US
5:05 PM	Maniraj Neupane	Association between Hospital Surge Strain and Mortality during the COVID-19 Pandemic: Global Patterns from A Scoping Review

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4:15 PM- Session IV-D FLASHTALKS: Animal Models and Immunology

5:30 PM

Chairs: Katie Bosio and P'ng Loke

4:15 PM	Kristina Feye	Preliminary Evaluation of CoV-NL63 Infection Model as a Surrogate for HCoV-19
4:20 PM	Manmeet Singh	SARS-CoV-2 Omicron BA.1 and BA.2 are attenuated in rhesus macaques as compared to Delta.
4:25 PM	Sabari nath Neerukonda	Characterization of Entry Pathways, Animal ACE2 Receptor Usage, and Antibody Neutralization Evasion of Omicron BA.1, BA.1.1, BA.2 and BA.3 Variants
4:30 PM	Mohanraj Manangeeswaran	BSL2-compliant lethal mouse model of SARS-COV-2 and variants of concern to evaluate therapeutics targeting the Spike protein
4:35 PM	Mallikarjun Bidarimath	COVID-19 Effects on Pregnancy and Prenatal & Postnatal Development
4:40 PM	Artiom Gruzdev	Cre-inducible hACE2 Mouse: A Novel COVID19 Animal Model
4:45 PM	Maryonne Snow-Smith	The Role of Eosinophils during SARS-CoV-2 Infection
4:50 PM	Oyebola Oyesola	Previous helminth infection enhances murine host resistance to SARS-CoV-2 through macrophage dependent T cell activation

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DAY TWO Friday, December 16th, 2022

10:00 AM KEYNOTE Senior Advisor for Global Health Equity at The Morehouse School of Medicine
Barney Graham **Rapid COVID-19 Vaccine Development: Could We Do It Again?**
Introduction by
Steve Holland

10:30 AM- 11:45AM SESSION V: Main Talks

Chairs: Sean Agbor-Enah and Pamela Schwartzberg

10:30 AM Matthew Gagne Heterologous SARS-CoV-2 antigen exposure in rhesus macaques with prior immunity to COVID-19 expands cross-reactive memory B cells due to antigenic imprinting and protects against Omicron challenge

10:43 AM Cyril Le Nouen* Intranasal pediatric parainfluenza virus-vectored SARS-CoV-2 vaccine is protective in macaques

10:48 AM Yongjun Sui* Mucosal vaccine protected SARS-CoV-2 infection in macaque and hamster models

10:53 AM Neeltje van Doremalen* Intranasal ChAdOx1 nCoV-19/AZD1222 vaccination reduces shedding of SARS-CoV-2 D614G in rhesus macaques

11:03 AM Pierce Radecki Intra-host Spike variants revealed by single-molecule sequencing: implications for SARS-CoV-2 mutation rates, evolutionary dynamics, and new VOCs

11:16 AM Joshua Tan Broadly neutralizing antibodies against coronaviruses

11:29 AM Andargie Temesgan Extensive cell damage in children with multisystem inflammatory syndrome

** Joint Q&A*

11:45 AM- 12PM BREAK

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12:00 PM- 1:00 PM SESSION VI-A FLASHTALKS: Epidemiology

Chairs: Emily Ricotta and Nick Williams

12:00 PM	Kimberly Dautel	Validation framework for epidemiological models with application to COVID-19 models
12:05 PM	Soo Ching Lee	Helminth infections are associated with a higher likelihood of non-vaccine induced SARS-CoV2 seroprevalence in India
12:10 PM	Mikhail Menis	Claims-based Study of Transfusion-Related Acute Lung Injury (TRALI) Among Inpatient U.S. Medicare Beneficiaries Ages 65 and Older, 2007-2021
12:15 PM	Christina Yek	Do Prognostic Scores Perform Differently in Surge-strained Hospitals?
12:20 PM	Nidia Trovao	Epidemiology and genetic diversity of SARS-CoV-2 lineages circulating in Africa
12:25 PM	Samantha Bents	The impact of COVID-19 non-pharmaceutical interventions on respiratory syncytial virus transmission in South Africa
12:30 PM	Chelsea Hansen	Excess mortality from influenza and RSV during the COVID-19 pandemic in the US: a natural experiment to clarify the etiology of respiratory pathogens
12:35 PM	Oliver Laeyendecker	Half of individuals attending the Johns Hopkins Hospital Emergency Department were infected by SARS-CoV-2 during the Omicron surge
12:40 PM	Claude Yinda Kwe	The effect of environmental conditions on transmission of SARS-CoV-2 in golden Syrian hamsters

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12:00 PM- 1:00 PM SESSION VI-B FLASHTALKS: Therapeutics

Chairs: Emily Lee and Osman Yogurtcu

12:00 PM	Jeffrey Strich	Impact of Fostamatinib on Myeloid Activation in COVID-19
12:05 PM	Qi Zhang	Heparan Sulfate assists SARS-CoV-2 in cell entry and can be targeted by inhibitor modulating heparan sulfate-spike complex
12:10 PM	Sinu John	Small molecule screening identifies Syk kinase inhibition and Rutaecarpine as modulators of macrophage training and SARS CoV-2 infection
12:15 PM	Lisa Henderson	Antisense oligonucleotides as therapeutic agents for SARS-CoV2
12:20 PM	Elia Lopez	Walking the viral genome: a large-scale anti-SARS-CoV-2 antisense oligonucleotide (ASO) screen
12:25 PM	Alexis Dean	Comparative assessment of the binding and neutralization activity of bispecific antibodies against SARS-CoV-2 variants
12:30 PM	Hyung Joon Kwon	Neutralization Profiles of Monoclonal Antibodies Derived from Ancestral SARS-CoV-2 Receptor Binding Domain
12:35 PM	Javeed Ahmad	Multivalency Enhances the affinity and neutralization efficiency of Nanobodies
12:40 PM	Cameron Allen	Using the NCATS Pharmaceutical Collection to Address COVID-19 Pathology
12:45 PM	Yogita Jethalani	Utilization of human ipsc-derived cell types for sars-cov-2 infection screening and drug discovery

12:00 PM- 1:00 PM SESSION VI-C FLASHTALKS: Vaccines and Diagnostics

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Chairs: Robin Levis and Nicole Doria-Rose

12:00 PM	Thayne Dickey	Computational design of stabilized RBD antigens enables potentially neutralizing SARS-CoV-2 vaccines
12:05 PM	Muhammad Khalid	COVID-19 mRNA Vaccine-Induced Anaphylaxis: An Early Look at COVAAR Clinical Outcomes
12:10 PM	Alla Kachko	Vaccine-associated respiratory pathology correlates with viral clearance and protective immunity after vaccination with self-amplifying RNA vaccine expressing spike (S) protein of SARS-2 CoV-2 in mouse models.
12:15 PM	Gabrielle Grubbs	Antibody affinity maturation and cross-variant activity following SARS-CoV-2 mRNA vaccination: Impact of prior exposure and sex
12:20 PM	Catherine Cotter	Enhanced Protection from SARS-CoV-2 Variants by MVA-Based Vaccines Expressing Matched or Mis-Matched S Proteins Administered Intranasally to hACE2 Mice
12:25 PM	Freya Van't Veer	Pre-clinical Immunogenicity and Efficacy of an Intranasal Adenovirus type 4 (Ad4) - Vectored SARS-CoV-2 Vaccine
12:30 PM	Purevdorj Olkhanud	Adjuvants to the S1-subunit of the SARS-CoV-2 spike protein vaccine improve antibody and T cell responses and surrogate antibody neutralization in mice
12:35 PM	Brady Hickerson	Evaluation of correlation between SARS-CoV-2 lentiviral pseudovirus neutralization assay and enzyme-linked immunosorbent assay
12:40 PM	Marufa Rumman	HCoV-NL63 viral titration approaches in vitro to make a close viral load estimation
12:45 PM	Megan Perry	S9.6 Monoclonal Antibody-based Hybrid-Capture Immunoassays for DNA-RNA Hybrids

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12:00 PM- 1:00 PM SESSION VI-D FLASHTALKS: Long COVID, Neuro, Mental Health, & Data Science

Chairs: Avindra Nath and Bryan Smith

12:00 PM	Govind Nair	Ex-Vivo magnetic resonance microscopy reveals extensive vascular pathology and neuronal injury with SARS-CoV-2 infection
12:05 PM	Michael Xydakis	World War COVID: The Olfactory Theater of Operations and Long COVID
12:10 PM	Courtney Vetter	The Effects of Symptomatology Before, During and After acute SARS-CoV-2 infection.
12:15 PM	Ally Freifeld	Mental Health Risk and Resilience During the COVID-19 Pandemic in Anabaptist Families with Mood Disorders
12:20 PM	Titilola Akintola	The Impact of Chronic Pain Condition on Mental Health Outcomes During the COVID-19 Pandemic
12:25 PM	Asiyah Lin	CIDO (Coronavirus Infectious Disease Ontology), a vehicle for COVID-19 data harmonization and integration
12:30 PM	Shanti Balasubramanian	A machine learning approach for predicting COVID-19 patients at risk of critical illness and mortality based on cell-free DNA
12:35 PM	Yichen Cheng	An open heterologous booster database for COVID-19 vaccines
12:40 PM	Nick Williams	The impact of historic non-COVID diagnosis on all-cause mortality among Medicare beneficiaries with a COVID-19 diagnosis, 1999-2021.
1:00 PM- 3:00 PM	BREAK	Special Event: Virtual Farewell for Dr. Fauci via NIH Videocast https://videocast.nih.gov/

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3:00 PM- SESSION VII: Vaccines

4:30PM

Chairs: Surender Khurana and Nihal Altan-Bonnet

3:00 PM	Clarisa Buckner	Recent SARS-CoV-2 infection affects magnitude and quality of antibody and B-cell responses to booster vaccination
3:10 PM	Barbara Felber	Systemic IL-15, IFN-gamma, and IP-10/CXCL10 signature associated with effective immune response to SARS CoV-2 in BNT162b2 mRNA vaccine recipients
3:20 PM	Lorenza Bellusci	Reduced durability of immunity to SARS-CoV-2 Omicron BA.1, BA.2 and BA.3 variants following vaccination in children with inflammatory bowel disease
3:30 PM	Mackenzie Zendt	Characterization of the immune response to COVID-19 vaccination among patients with a wide range of immunodeficiencies
3:37 PM	Sabrina Bush	Three-Dose mRNA Vaccination Elicits, Expands, and Matures Neutralizing Antibody Lineages Common to SARS-CoV-2 NaVØve and Infected Donors
3:44 PM	Ujwani Nukala	Quantitative Benefit-Risk Assessment of mRNA-Based Covid-19 Vaccines Using Real-World Data
3:51 PM	Mary Smolskis	International Study on COVID-19 Vaccine to Assess Immunogenicity, Reactogenicity and Efficacy (InVITE)
3:58 PM	Charles Stauff	Development of a Live-Attenuated SARS-CoV-2 Vaccine Candidate by Targeted Mutation of the Nonstructural 1 Protein.
4:05 PM	Jaekwan Kim	SARS-CoV-1 and SARS-CoV-2 Nucleocapsid-based Vaccines induce SARS-CoV-2 Nucleocapsid specific T-cell responses that do not result in enhanced disease following challenge
4:30 PM	Closing remarks Nina Schor	Deputy Director, Division of Intramural Research, NIH

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Acknowledgements

We would like to thank Dr. Janet Woodcock, Dr. Barney Graham and Dr. Nina Schor for their invaluable leadership and participation in the workshop.

We also thank our wonderful session chairs: Surender Khurana, Nihal Altan-Bonnet, Alex Compton, Eric Freed, Robin Stanley, Veronique Nussenblatt, Irini Sereti, Matt Hall, Tracey Roualt, Daniela Verthelyi, Mark Connors, Kanal Singh, Renee Ridzon, Peter Sun, Emily Ricotta, Hilary Marston, Katie Bosio, P'ng Loke, Pamela Schwartzberg, Sean Agbor-Enah, Nick Williams, Emily Lee, Osman Yogurtcu, Robin Levis, Nicole Doria Rose, Avi Nath, Bryan Smith, and Steve Holland for their contributions and help.

We would also like to give a big thanks to the NCI, especially Janene Nursenty for assistance with web design, and Jose Aragon, Maurice Edmonds and their staff from the NCI Center for Biomedical Informatics and Information Technology.

We would also like to thank the Office of Intramural Research especially Chris Wanjek, Chuck Dearolf, Karen Nemes, and Diana Gomez for their support of the COVID-19 SIG and help in making this workshop happen.

And most of all we would like to all the study participants who have volunteered in drug and vaccine trials and our workshop speakers and other researchers from the NIH and the FDA for all their dedication and hard work on COVID-19, including the other members of the steering committee who have made this workshop possible.

Finally, we dedicate this workshop to Dr. Anthony Fauci for his unwavering leadership during this and other public health crises worldwide. We encourage all to attend the virtual farewell for Dr. Fauci on Friday December 16th at 1pm.

With many thanks from the COVID-19 Scientific Interest Group Steering committee:

Nihal Altan-Bonnet, NHLBI
Alex Compton, NCI
Surender Khurana, FDA
Emily Lee, NCATS
Veronique Nussenblatt, NIAID
Emily Ricotta, NIAID
Pamela Schwartzberg, NIAID
Kanal Singh, NIAID